



SEQUENCE LISTING

Flint, Andrew J.
Cool, Deborah E.

<1> IMPROVED ASSAY FOR PROTEIN TYROSINE
PHOSPHATES

<100> 200125.401

<110> US/09/788,626

<121> 2001-02-13

<160> 40

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 11

<212> PRT

<213> Artificial Sequence

<310>

<311> VARIANT

<312> (1)...(1)

<313> Xaa = Ile or Val

<314> VARIANT

<315> (4)...(4)

<316> Xaa = any amino acid

<317> VARIANT

<318> (7)...(7)

<319> Xaa = any amino acid

<320> VARIANT

<321> (8)...(8)

<322> Xaa = any amino acid

<323> VARIANT

<324> (10)...(10)

<325> Xaa = Ser or Thr

<326> Unique signature sequence motif which is invariant
among all PTPs.

<400> 1

Gla His Cys Xaa Ala Gly Xaa Xaa Arg Xaa Gly

1 5 10

<210> 2

<211> 254

<212> PRT

<213> Homo sapiens

<400> 2

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Asp Phe Pro Cys Arg Val Ala Lys Leu Pro Lys Asn Lys Asn Arg Asn
 1           5           10           15
Arg Tyr Arg Asp Val Ser Pro Phe Asp His Ser Arg Ile Lys Leu His
 20           25           30
Gln Glu Asp Asn Asp Tyr Ile Asn Ala Ser Leu Ile Lys Met Glu Glu
 35           40           45
Ala Gln Arg Ser Tyr Ile Leu Thr Gln Gly Pro Leu Pro Asn Thr Cys
 50           55           60
Gly His Phe Trp Glu Met Val Trp Glu Gln Lys Ser Arg Gly Val Val
 65           70           75           80
Met Leu Asn Arg Val Met Glu Lys Gly Ser Leu Lys Cys Ala Gln Tyr
 85           90           95
Trp Pro Gln Lys Glu Glu Lys Glu Met Ile Phe Glu Asp Thr Asn Leu
100          105          110
Lys Leu Thr Leu Ile Ser Glu Asp Ile Lys Ser Tyr Tyr Thr Val Leu
115          120          125
Glu Leu Glu Asn Leu Thr Thr Gln Glu Thr Arg Glu Ile Leu His Phe
130          135          140
His Tyr Thr Thr Trp Pro Asp Phe Gly Val Pro Glu Ser Pro Ala Ser
145          150          155          160
Phe Leu Asn Phe Leu Phe Lys Val Arg Glu Ser Gly Ser Leu Ser Pro
165          170          175
Glu His Gly Pro Val Val Val His Cys Ser Ala Gly Ile Gly Arg Ser
180          185          190
Gly Thr Phe Cys Leu Ala Asp Thr Cys Leu Leu Leu Met Asp Lys Arg
195          200          205
Lys Asp Pro Ser Ser Val Asp Ile Lys Lys Val Leu Leu Glu Met Arg
210          215          220
Lys Phe Arg Met Gly Leu Ile Gln Thr Ala Asp Gln Leu Arg Phe Ser
225          230          235          240
Tyr Leu Ala Val Ile Glu Gly Ala Lys Phe Ile Met Gly Asp
245          250

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<210> 3

<211> 251

<212> PRT

<213> Homo sapiens

<400> 3

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Asp Tyr Pro His Arg Val Ala Lys Phe Pro Glu Asn Arg Asn Arg Asn
 1           5           10           15
Arg Tyr Arg Asp Val Ser Pro Tyr Asp His Ser Arg Val Leu Gln Asn
 20           25           30
Ala Glu Asn Asp Tyr Ile Asn Ala Ser Leu Val Asp Ile Glu Glu Ala
 35           40           45
Gln Arg Ser Tyr Ile Leu Thr Gln Gly Pro Leu Pro Asn Thr Cys Cys
 50           55           60
His Phe Trp Leu Met Val Trp Gln Gln Lys Thr Lys Ala Val Val Met
 65           70           75           80
Leu Asn Arg Ile Val Glu Lys Glu Ser Val Lys Cys Ala Gln Tyr Trp
 85           90           95

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Pro Thr Asp Asp Gln Glu Met Leu Phe Lys Glu Thr Gly Phe Ser Val
 100 105 110
 Lys Leu Leu Ser Glu Asp Val Lys Ser Tyr Tyr Thr Val Leu Gln Leu
 115 120 125
 Glu Asn Ile Asn Ser Gly Glu Thr Arg Thr Ile Ser His Phe His Tyr
 130 135 140
 Thr Thr Trp Pro Asp Phe Gly Val Pro Glu Ser Pro Ala Ser Phe Leu
 145 150 155 160
 Asn Phe Leu Phe Lys Val Arg Glu Ser Gly Ser Leu Asn Pro Asp His
 165 170 175
 Gly Pro Ala Val Ile His Cys Ser Ala Gly Ile Gly Arg Ser Gly Thr
 180 185 190
 Phe Ser Leu Val Asp Thr Cys Leu Val Leu Met Glu Lys Gly Asp Asp
 195 200 205
 Ile Asn Ile Lys Gln Val Leu Leu Asn Met Arg Lys Tyr Arg Met Gly
 210 215 220
 Leu Ile Gln Thr Pro Asp Gln Leu Arg Phe Ser Tyr Met Ala Ile Ile
 225 230 235 240
 Glu Gly Ala Lys Cys Ile Lys Gly Asp Ser Ser
 245 250

<210> 4
 <211> 317
 <212> PRT
 <213> Homo sapiens

<400> 4
 Gly Ile Thr Ala Asp Ser Ser Asn His Pro Asp Asn Lys His Lys Asn
 1 5 10 15
 Arg Tyr Ile Asn Ile Val Ala Tyr Asp His Ser Arg Val Lys Leu Ala
 20 25 30
 Gln Leu Ala Glu Lys Asp Gly Lys Leu Thr Asp Tyr Ile Asn Ala Asn
 35 40 45
 Tyr Val Asp Gly Tyr Asn Arg Pro Lys Ala Tyr Ile Ala Ala Gln Gly
 50 55 60
 Pro Leu Lys Ser Thr Ala Glu Asp Phe Trp Arg Met Ile Trp Glu His
 65 70 75 80
 Asn Val Glu Val Ile Val Met Ile Thr Asn Leu Val Glu Lys Gly Arg
 85 90 95
 Arg Lys Cys Asp Gln Tyr Trp Pro Pro Ala Asp Gly Ser Glu Glu Tyr
 100 105 110
 Gly Asn Phe Leu Val Thr Gln Lys Ser Val Gln Val Leu Ala Tyr Tyr
 115 120 125
 Thr Val Phe Thr Leu Arg Asn Thr Lys Ile Lys Lys Gly Ser Gln Lys
 130 135 140
 Gly Arg Pro Ser Gly Arg Val Val Thr Gln Tyr His Tyr Thr Gln Trp
 145 150 155 160
 Pro Asp Met Gly Val Pro Glu Tyr Ser Leu Pro Val Leu Thr Phe Val
 165 170 175
 Arg Lys Ala Ala Tyr Ala Lys Arg His Ala Val Gly Pro Val Val Val
 180 185 190
 His Cys Ser Ala Gly Val Gly Arg Thr Gly Thr Tyr Ile Val Leu Asp
 195 200 205
 Ser Met Leu Gln Gln Ile Gln His Glu Gly Thr Val Asn Ile Phe Gly

215 215 220
 Phe Leu Lys His Ile Arg Ser Gln Arg Asn Tyr Leu Val Gln Thr Glu
 225 230 235 240
 Glu Gln Tyr Val Phe Ile His Asp Thr Leu Val Glu Ala Ile Leu Ser
 245 250 255
 Lys Glu Thr Glu Val Val Leu Asp Ser Met Leu Gln Gln Ile Gln His
 260 265 270
 Glu Gly Thr Val Asn Ile Phe Gly Phe Leu Lys His Ile Arg Ser Gln
 275 280 285
 Arg Asn Tyr Leu Val Gln Thr Glu Glu Gln Tyr Val Phe Ile His Asp
 290 295 300
 Thr Leu Val Glu Ala Ile Leu Ser Lys Glu Thr Glu Val
 305 310 315

<210> 5

<211> 316

<212> PRT

<213> Homo sapiens

<400> 5

Gly Ile Thr Ala Asp Ser Ser Asn His Pro Asp Asn Lys His Lys Asn
 1 5 10 15
 Arg Tyr Ile Asn Ile Val Ala Tyr Asp His Ser Arg Val Lys Leu Ala
 20 25 30
 Gln Leu Ala Glu Lys Asp Gly Lys Leu Thr Asp Tyr Ile Asn Ala Asn
 35 40 45
 Tyr Val Asp Gly Tyr Asn Arg Pro Lys Ala Tyr Ile Ala Ala Gln Gly
 50 55 60
 Pro Leu Lys Ser Thr Ala Glu Asp Phe Trp Arg Met Ile Trp Glu His
 65 70 75 80
 Asn Val Glu Val Ile Val Met Ile Thr Asn Leu Val Glu Lys Gly Arg
 85 90 95
 Arg Lys Cys Asp Gln Tyr Trp Pro Ala Asp Gly Ser Glu Glu Tyr Gly
 100 105 110
 Asn Phe Leu Val Thr Gln Lys Ser Val Gln Val Leu Ala Tyr Tyr Thr
 115 120 125
 Val Phe Thr Leu Arg Asn Thr Lys Ile Lys Lys Gly Ser Gln Lys Gly
 130 135 140
 Arg Pro Ser Gly Arg Val Val Thr Gln Tyr His Tyr Thr Gln Trp Pro
 145 150 155 160
 Asp Met Gly Val Pro Glu Tyr Ser Leu Pro Val Leu Thr Phe Val Arg
 165 170 175
 Lys Ala Ala Tyr Ala Lys Arg His Ala Val Gly Pro Val Val Val His
 180 185 190
 Cys Ser Ala Gly Val Gly Arg Thr Gly Thr Tyr Ile Val Leu Asp Ser
 195 200 205
 Met Leu Gln Gln Ile Gln His Glu Gly Thr Val Asn Ile Phe Gly Phe
 210 215 220
 Leu Lys His Ile Arg Ser Gln Arg Asn Tyr Leu Val Gln Thr Glu Glu
 225 230 235 240
 Gln Tyr Val Phe Ile His Asp Thr Leu Val Glu Ala Ile Leu Ser Lys
 245 250 255
 Glu Thr Glu Val Val Leu Asp Ser Met Leu Gln Gln Ile Gln His Glu
 260 265 270

Gly Thr Val Asn Ile Phe Gly Phe Leu Lys His Ile Arg Ser Gln Arg
 275 280 285
 Asn Tyr Leu Val Gln Thr Glu Glu Gln Tyr Val Phe Ile His Asp Thr
 290 295 300
 Leu Val Glu Ala Ile Leu Ser Lys Glu Thr Glu Val
 305 310 315

<210> 6
 <211> 319
 <212> PRT
 <213> Homo sapiens

<400> 6
 Asn Ile Thr Ala Glu His Ser Asn His Pro Glu Asn Lys His Lys Asn
 1 5 10 15
 Arg Tyr Ile Asn Ile Leu Ala Tyr Asp His Ser Arg Val Lys Leu Arg
 20 25 30
 Pro Leu Pro Gly Lys Asp Ser Lys His Ser Asp Tyr Ile Asn Ala Asn
 35 40 45
 Tyr Val Asp Gly Tyr Asn Lys Ala Lys Ala Tyr Ile Ala Thr Gln Gly
 50 55 60
 Pro Leu Lys Ser Thr Phe Glu Asp Phe Trp Arg Met Ile Trp Glu Gln
 65 70 75 80
 Asn Thr Gly Ile Ile Val Met Ile Thr Asn Leu Val Glu Lys Gly Arg
 85 90 95
 Arg Lys Cys Asp Gln Tyr Trp Pro Thr Glu Asn Ser Glu Glu Tyr Gly
 100 105 110
 Asn Ile Ile Val Thr Leu Lys Ser Thr Lys Ile His Ala Cys Tyr Thr
 115 120 125
 Val Phe Ser Ile Arg Asn Thr Lys Val Lys Lys Gly Gln Lys Gly Asn
 130 135 140
 Pro Lys Gly Arg Gln Asn Glu Arg Val Val Ile Gln Tyr His Tyr Thr
 145 150 155 160
 Gln Trp Pro Asp Met Gly Val Pro Glu Tyr Ala Leu Pro Val Leu Thr
 165 170 175
 Phe Val Arg Arg Ser Ser Ala Ala Arg Met Pro Glu Thr Gly Pro Val
 180 185 190
 Leu Val His Cys Ser Ala Gly Val Gly Arg Thr Gly Thr Tyr Ile Val
 195 200 205
 Ile Asp Ser Met Leu Gln Gln Ile Lys Asp Lys Ser Thr Val Asn Val
 210 215 220
 Leu Gly Phe Leu Lys His Ile Arg Thr Gln Arg Asn Tyr Leu Val Gln
 225 230 235 240
 Thr Glu Glu Gln Tyr Ile Phe Ile His Asp Ala Leu Leu Glu Ala Ile
 245 250 255
 Leu Gly Lys Glu Thr Glu Val Val Ile Asp Ser Met Leu Gln Gln Ile
 260 265 270
 Lys Asp Lys Ser Thr Val Asn Val Leu Gly Phe Leu Lys His Ile Arg
 275 280 285
 Thr Gln Arg Asn Tyr Leu Val Glu Thr Glu Glu Gln Tyr Ile Phe Ile
 290 295 300
 His Asp Ala Leu Leu Glu Ala Ile Leu Gly Lys Glu Thr Glu Val
 305 310 315

<210> 7
 <211> 313
 <212> PRT
 <213> *Drosophila melanogaster*

<400> 7
 Asp Leu Pro Cys Glu His Ser Gln His Pro Glu Asn Lys Arg Lys Asn
 1 5 10 15
 Arg Tyr Leu Asn Ile Thr Ala Tyr Asp His Ser Arg Val His Leu His
 20 25 30
 Pro Thr Pro Gly Gln Lys Lys Asn Leu Asp Tyr Ile Asn Ala Asn Phe
 35 40 45
 Ile Asp Gly Tyr Gln Lys Gly His Ala Phe Ile Gly Thr Gln Gly Pro
 50 55 60
 Leu Pro Asp Thr Phe Asp Cys Phe Trp Arg Met Ile Trp Glu Gln Arg
 65 70 75 80
 Val Ala Ile Ile Val Met Ile Thr Asn Leu Val Glu Arg Gly Arg Arg
 85 90 95
 Lys Cys Asp Met Tyr Trp Pro Lys Asp Gly Val Glu Thr Tyr Gly Val
 100 105 110
 Ile Gln Val Lys Leu Ile Glu Glu Glu Val Met Ser Thr Tyr Thr Val
 115 120 125
 Leu Gln Ile Lys His Leu Lys Leu Lys Lys Lys Lys Gln Cys Asn Thr
 130 135 140
 Glu Lys Leu Val Tyr Gln Tyr His Tyr Thr Asn Trp Pro Asp His Gly
 145 150 155 160
 Thr Pro Asp His Pro Leu Pro Val Leu Asn Phe Val Lys Lys Ser Ser
 165 170 175
 Ala Ala Asn Pro Ala Glu Ala Gly Pro Ile Val Val His Cys Ser Ala
 180 185 190
 Gly Val Gly Arg Thr Gly Thr Tyr Ile Val Leu Asp Ala Met Leu Lys
 195 200 205
 Gln Ile Gln Gln Lys Asn Ile Val Asn Val Phe Gly Phe Leu Arg His
 210 215 220
 Ile Arg Ala Gln Arg Asn Phe Leu Val Gln Thr Glu Glu Gln Tyr Ile
 225 230 235 240
 Phe Leu His Asp Ala Leu Val Glu Ala Ile Ala Ser Gly Glu Thr Asn
 245 250 255
 Leu Val Leu Asp Ala Met Leu Lys Gln Ile Gln Gln Lys Asn Ile Val
 260 265 270
 Asn Val Phe Gly Phe Leu Arg His Ile Arg Ala Gln Arg Asn Phe Leu
 275 280 285
 Val Gln Thr Glu Glu Gln Tyr Ile Phe Leu His Asp Ala Leu Val Glu
 290 295 300
 Ala Ile Ala Ser Gly Glu Thr Asn Leu
 305 310

<210> 8
 <211> 306
 <212> PRT
 <213> *Homo sapiens*

<400> 8
 Gln Phe Thr Trp Glu Asn Ser Asn Leu Glu Val Asn Lys Trp Lys Asn

1 5 10 15
 Arg Tyr Ala Asn Val Ile Ala Tyr Asp His Ser Arg Val Ile Leu Thr
 20 25 30
 Ser Ile Asp Gly Val Pro Gly Ser Asp Tyr Ile Asn Ala Asn Tyr Ile
 35 40 45
 Asp Gly Tyr Arg Lys Gln Asn Ala Tyr Ile Ala Thr Gln Gly Pro Leu
 50 55 60
 Pro Glu Thr Met Gly Asp Phe Trp Arg Met Val Trp Glu Gln Arg Thr
 65 70 75 80
 Ala Thr Val Val Met Met Thr Arg Leu Glu Glu Lys Ser Arg Val Lys
 85 90 95
 Cys Asp Gln Tyr Trp Pro Ala Arg Gly Thr Glu Thr Cys Gly Leu Ile
 100 105 110
 Gln Val Thr Leu Leu Asp Thr Val Glu Leu Ala Thr Tyr Thr Val Phe
 115 120 125
 Ala Leu His Lys Ser Gly Ser Ser Glu Lys Arg Glu Leu Arg Gln Phe
 130 135 140
 Glu Phe Met Ala Trp Pro Asp His Gly Val Pro Glu Tyr Pro Thr Pro
 145 150 155 160
 Ile Leu Ala Phe Leu Arg Arg Val Lys Ala Cys Asn Pro Leu Asp Ala
 165 170 175
 Gly Pro Met Val Val His Cys Ser Ala Gly Val Gly Arg Thr Gly Cys
 180 185 190
 Phe Ile Val Ile Asp Ala Met Leu Glu Arg Met Lys His Glu Lys Thr
 195 200 205
 Val Asp Ile Tyr Gly His Val Thr Cys Met Arg Ser Gln Arg Asn Tyr
 210 215 220
 Met Val Gln Thr Glu Asp Gln Tyr Val Phe Ile His Glu Ala Leu Leu
 225 230 235 240
 Glu Ala Ala Thr Cys Gly His Thr Glu Val Val Ile Asp Ala Met Leu
 245 250 255
 Glu Arg Met Lys His Glu Lys Thr Val Asp Ile Tyr Gly His Val Thr
 260 265 270
 Cys Met Arg Ser Gln Arg Asn Tyr Met Val Gln Thr Glu Asp Gln Tyr
 275 280 285
 Val Phe Ile His Glu Ala Leu Leu Glu Ala Ala Thr Cys Gly His Thr
 290 295 300
 Glu Val
 305

<210> 9

<211> 305

<212> PRT

<213> Homo sapiens

<400> 9

Ser Ala Pro Trp Asp Ser Ala Lys Lys Asp Glu Asn Arg Met Lys Asn
 1 5 10 15
 Arg Tyr Gly Asn Ile Ile Ala Tyr Asp His Ser Arg Val Arg Leu Gln
 20 25 30
 Thr Ile Glu Gly Asp Thr Asn Ser Asp Tyr Ile Asn Gly Asn Tyr Ile
 35 40 45
 Asp Gly Tyr His Arg Pro Asn His Tyr Ile Ala Thr Gln Gly Pro Met
 50 55 60

Gln Glu Thr Ile Tyr Asp Phe Trp Arg Met Val Trp His Glu Asn Thr
 65 70 75 80
 Ala Ser Ile Ile Met Val Thr Asn Leu Val Glu Val Gly Arg Val Lys
 85 90 95
 Cys Cys Lys Tyr Trp Pro Asp Asp Thr Glu Ile Tyr Lys Asp Ile Lys
 100 105 110
 Val Thr Leu Ile Glu Thr Glu Leu Ala Glu Tyr Val Ile Phe Ala
 115 120 125
 Val Glu Lys Arg Gly Val His Glu Ile Arg Glu Ile Arg Gln Phe His
 130 135 140
 Phe Thr Gly Trp Pro Asp His Gly Val Pro Tyr His Ala Thr Gly Leu
 145 150 155 160
 Leu Gly Phe Val Arg Gln Val Lys Ser Lys Ser Pro Pro Ser Ala Gly
 165 170 175
 Pro Leu Val Val His Cys Ser Ala Gly Ala Gly Arg Thr Gly Cys Phe
 180 185 190
 Ile Val Ile Asp Ile Met Leu Asp Met Ala Glu Arg Glu Gly Val Val
 195 200 205
 Asp Ile Tyr Asn Cys Val Arg Glu Leu Arg Ser Arg Arg Val Asn Met
 210 215 220
 Val Gln Thr Glu Glu Gln Tyr Val Phe Ile His Asp Ala Ile Leu Glu
 225 230 235 240
 Ala Cys Leu Cys Gly Asp Thr Ser Val Val Ile Asp Ile Met Leu Asp
 245 250 255
 Met Ala Glu Arg Glu Gly Val Val Asp Ile Tyr Asn Cys Val Arg Glu
 260 265 270
 Leu Arg Ser Arg Arg Val Asn Met Val Gln Thr Glu Glu Gln Tyr Val
 275 280 285
 Phe Ile His Asp Ala Ile Leu Glu Ala Cys Leu Cys Gly Asp Thr Ser
 290 295 300
 Val
 305

<:10> 10

<:11> 310

<:12> PRT

<:13> Homo sapiens

<400> 10

Gln Ala Thr Cys Glu Ala Ala Ser Lys Glu Glu Asn Lys Glu Lys Asn
 1 5 10 15
 Arg Tyr Val Asn Ile Leu Pro Tyr Asp His Ser Arg Val His Leu Thr
 20 25 30
 Pro Val Glu Gly Val Pro Asp Ser Asp Tyr Ile Asn Ala Ser Phe Ile
 35 40 45
 Asn Gly Tyr Gln Glu Lys Asn Lys Phe Ile Ala Ala Gln Gly Pro Lys
 50 55 60
 Glu Glu Thr Val Asn Asp Phe Trp Arg Met Ile Trp Glu Gln Asn Thr
 65 70 75 80
 Ala Thr Ile Val Met Val Thr Asn Leu Lys Glu Arg Lys Glu Cys Lys
 85 90 95
 Cys Ala Gln Tyr Trp Pro Asp Gln Gly Cys Trp Thr Tyr Gly Asn Ile
 100 105 110
 Arg Val Ser Val Glu Asp Val Thr Val Leu Val Asp Tyr Thr Val Phe

115	120	125
Cys Ile Gln Gln Val Gly Asp Met Thr Asn Arg Lys Pro Gln Arg Leu		
130	135	140
Ile Thr Gln Phe His Phe Thr Ser Trp Pro Asp Phe Gly Val Pro Phe		
145	150	155
Thr Pro Ile Gly Met Leu Lys Phe Leu Lys Lys Val Lys Ala Cys Asn		
	165	170
Pro Gln Tyr Ala Gly Ala Ile Val Val His Cys Ser Ala Gly Val Gly		
	180	185
Arg Thr Gly Thr Phe Val Val Ile Asp Ala Met Leu Asp Met Met His		
	195	200
Thr Glu Arg Lys Val Asp Val Tyr Gly Phe Val Ser Arg Ile Arg Ala		
	210	215
Gln Arg Cys Gln Met Val Gln Thr Asp Met Gln Tyr Val Phe Ile Tyr		
225	230	235
Gln Ala Leu Leu Glu His Tyr Leu Tyr Gly Asp Thr Glu Leu Val Ile		
	245	250
Asp Ala Met Leu Asp Met Met His Thr Glu Arg Lys Val Asp Val Tyr		
	260	265
Gly Phe Val Ser Arg Ile Arg Ala Gln Arg Cys Gln Met Val Gln Thr		
	275	280
Asp Met Gln Tyr Val Phe Ile Tyr Gln Ala Leu Leu Glu His Tyr Leu		
	290	295
Tyr Gly Asp Thr Glu Leu		300
305	310	

<210> 11

<211> 209

<212> PRT

<213> Homo sapiens

<400> 11

Gln Gly Thr Phe Glu Leu Ala Asn Lys Glu Glu Asn Arg Glu Lys Asn		
1	5	10
Arg Tyr Pro Asn Ile Leu Pro Asn Asp His Ser Arg Val Ile Leu Ser		
	20	25
Gln Leu Asp Gly Ile Pro Cys Ser Asp Tyr Ile Asn Ala Ser Tyr Ile		
	35	40
Asp Gly Tyr Lys Glu Lys Asn Lys Phe Ile Ala Ala Gln Gly Pro Lys		
	50	55
Gln Glu Thr Val Asn Asp Phe Trp Arg Met Val Trp Glu Gln Lys Ser		
65	70	75
Ala Thr Ile Val Met Leu Thr Asn Leu Lys Glu Arg Lys Glu Glu Lys		
	85	90
Cys His Gln Tyr Trp Pro Asp Gln Gly Cys Trp Thr Tyr Gly Asn Ile		
	100	105
Arg Val Cys Val Glu Asp Cys Val Val Leu Val Asp Tyr Thr Ile Phe		
	115	120
Cys Ile Gln Pro Gln Leu Pro Asp Gly Cys Lys Ala Pro Arg Leu Val		
	130	135
Ser Gln Leu His Phe Thr Ser Trp Pro Asp Phe Gly Val Pro Phe Thr		
145	150	155
Pro Ile Gly Met Leu Lys Phe Leu Lys Lys Val Lys Thr Leu Asn Pro		
	165	170
		175

Val His Ala Gly Pro Ile Val Val His Cys Ser Ala Gly Val Gly Arg
 180 185 190
 Thr Gly Thr Phe Ile Val Ile Asp Ala Met Met Ala Met Met His Ala
 195 200 205
 Glu Gln Lys Val Asp Val Phe Glu Phe Val Ser Arg Ile Arg Asn Gln
 210 215 220
 Arg Pro Gln Met Val Gln Thr Asp Met Gln Tyr Thr Phe Ile Tyr Gln
 225 230 235 240
 Ala Leu Leu Glu Tyr Tyr Leu Tyr Gly Asp Thr Glu Leu Val Ile Asp
 245 250 255
 Ala Met Met Ala Met Met His Ala Glu Gln Lys Val Asp Val Phe Glu
 260 265 270
 Phe Val Ser Arg Ile Arg Asn Gln Arg Pro Gln Met Val Gln Thr Asp
 275 280 285
 Met Gln Tyr Thr Phe Ile Tyr Gln Ala Leu Leu Glu Tyr Tyr Leu Tyr
 290 295 300
 Gly Asp Thr Glu Leu
 305

<210> 12

<211> 309

<212> PRT

<213> Mus musculus

<400> 12

Lys Phe Pro Ile Lys Asp Ala Arg Lys Pro His Asn Gln Asn Lys Asn
 1 5 10 15
 Arg Tyr Val Asp Ile Leu Pro Tyr Asp Tyr Asn Arg Val Glu Leu Ser
 20 25 30
 Glu Ile Asn Gly Asp Ala Gly Ser Thr Tyr Ile Asn Ala Ser Tyr Ile
 35 40 45
 Asp Gly Phe Lys Glu Pro Arg Lys Tyr Ile Ala Ala Gln Gly Pro Arg
 50 55 60
 Asp Glu Thr Val Asp Asp Phe Trp Arg Met Ile Trp Glu Gln Lys Ala
 65 70 75 80
 Thr Val Ile Val Met Val Thr Arg Cys Glu Glu Gly Asn Arg Asn Lys
 85 90 95
 Cys Ala Glu Tyr Trp Pro Ser Met Glu Glu Gly Thr Arg Ala Phe Lys
 100 105 110
 Asp Ile Val Val Thr Ile Asn Asp His Lys Arg Cys Pro Asp Tyr Ile
 115 120 125
 Ile Leu Asn Val Ala His Lys Lys Glu Lys Ala Thr Gly Arg Glu Val
 130 135 140
 Thr His Ile Gln Phe Thr Ser Trp Pro Asp His Gly Val Pro Glu Asp
 145 150 155 160
 Pro His Leu Leu Leu Lys Leu Arg Arg Arg Val Asn Ala Phe Ser Asn
 165 170 175
 Phe Phe Ser Gly Pro Ile Val Val His Cys Ser Ala Gly Val Gly Arg
 180 185 190
 Thr Gly Thr Tyr Ile Gly Ile Asp Ala Met Leu Glu Gly Leu Glu Ala
 195 200 205
 Glu Gly Lys Val Asp Val Tyr Gly Tyr Val Val Lys Leu Arg Arg Gln
 210 215 220
 Arg Cys Leu Met Val Gln Val Glu Ala Gln Tyr Ile Leu Ile His Gln

[illegible]

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<210> 13
<211> 325
<212> PRT
<213> Homo sapiens
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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Arg	Tyr	Lys	Asn	Ile	Leu	Pro	Phe	Asp	His	Thr	Arg	Val	Val	Leu	His		
20								25						30			
Asp	Gly	Asp	Pro	Asn	Glu	Pro	Val	Ser	Asp	Tyr	Ile	Asn	Ala	Asn	Ile		
35							40					45					
Ile	Met	Pro	Glu	Phe	Glu	Thr	Lys	Cys	Asn	Asn	Ser	Lys	Pro	Lys	Lys		
50						55					60						
Ser	Tyr	Ile	Ala	Thr	Gln	Gly	Cys	Leu	Gln	Asn	Thr	Val	Asn	Asp	Phe		
65					70					75					80		
Trp	Arg	Met	Val	Phe	Gln	Glu	Asn	Ser	Arg	Val	Ile	Val	Met	Thr	Thr		
				85				90						95			
Lys	Glu	Val	Glu	Arg	Gly	Lys	Ser	Lys	Cys	Val	Lys	Tyr	Trp	Pro	Asp		
			100					105					110				
Glu	Tyr	Ala	Leu	Lys	Glu	Tyr	Gly	Val	Met	Arg	Val	Arg	Asn	Val	Lys		
		115					120					125					
Glu	Ser	Ala	Ala	His	Asp	Tyr	Thr	Leu	Leu	Lys	Leu	Ser	Lys	Val	Gly		
	130				135						140						
Gln	Gly	Asn	Thr	Glu	Arg	Thr	Val	Trp	Gln	Tyr	His	Phe	Arg	Thr	Trp		
145				150						155					160		
Pro	Asp	His	Gly	Val	Pro	Ser	Asp	Pro	Gly	Gly	Val	Leu	Asp	Phe	Leu		
			165					170						175			
Glu	Glu	Val	His	His	Lys	Gln	Glu	Ser	Ile	Met	Asp	Ala	Gly	Pro	Val		
			180					185					190				
Val	Val	His	Cys	Ser	Ala	Gly	Ile	Gly	Arg	Thr	Gly	Thr	Phe	Ile	Val		
	195						200					205					
Ile	Asp	Ile	Leu	Ile	Asp	Ile	Ile	Arg	Glu	Lys	Gly	Val	Asp	Cys	Asp		
	210					215					220						
Ile	Asp	Val	Pro	Lys	Thr	Ile	Gln	Met	Val	Arg	Ser	Gln	Arg	Ser	Gly		
225					230					235					240		
Met	Val	Gln	Thr	Glu	Ala	Gln	Tyr	Arg	Phe	Ile	Tyr	Met	Ala	Val	Gln		
			245					250						255			
His	Tyr	Ile	Glu	Thr	Leu	Gln	Arg	Arg	Ile	Val	Ile	Asp	Ile	Leu	Ile		
		260					265					270					
Asp	Ile	Ile	Arg	Glu	Lys	Gly	Val	Asp	Cys	Asp	Ile	Asp	Val	Pro	Lys		
			275				280					285					

Thr Ile Gln Met Val Arg Ser Gln Arg Ser Gly Met Val Gln Thr Glu
 290 295 300
 Ala Gln Tyr Arg Phe Ile Tyr Met Ala Val Gln His Tyr Ile Glu Thr
 305 310 315 320
 Leu Gln Arg Arg Ile
 325

<210> 14

<211> 322

<212> PRT

<213> Homo sapiens

<400> 14

Leu His Gln Arg Leu Glu Gly Gln Arg Pro Glu Asn Lys Gly Lys Asn
 1 5 10 15
 Arg Tyr Lys Asn Ile Leu Pro Phe Asp His Ser Arg Val Ile Leu Gln
 20 25 30
 Gly Arg Asp Ser Asn Ile Pro Gly Ser Asp Tyr Ile Asn Ala Asn Tyr
 35 40 45
 Ile Lys Asn Gln Leu Leu Gly Pro Asp Glu Asn Ala Lys Thr Tyr Ile
 50 55 60
 Ala Ser Gln Gly Cys Leu Glu Ala Thr Val Asn Asp Phe Trp Gln Met
 65 70 75 80
 Ala Trp Gln Glu Asn Ser Arg Val Ile Val Met Thr Thr Arg Glu Val
 85 90 95
 Glu Lys Gly Arg Asn Lys Cys Val Pro Tyr Trp Pro Glu Val Gly Met
 100 105 110
 Gln Arg Ala Tyr Gly Pro Tyr Ser Val Thr Asn Cys Gly Glu His Asp
 115 120 125
 Thr Thr Glu Tyr Lys Leu Leu Gln Val Ser Pro Leu Asp Asn Gly Asp
 130 135 140
 Leu Ile Arg Glu Ile Trp His Tyr Gln Tyr Leu Ser Trp Pro Asp His
 145 150 155 160
 Gly Val Pro Ser Glu Pro Gly Gly Val Leu Ser Phe Leu Asp Gln Ile
 165 170 175
 Asn Gln Arg Gln Glu Ser Leu Pro His Ala Gly Pro Ile Ile Val His
 180 185 190
 Cys Ser Ala Gly Ile Gly Arg Thr Gly Thr Ile Ile Val Ile Asp Met
 195 200 205
 Leu Met Glu Asn Ile Ser Thr Lys Gly Leu Asp Cys Asp Ile Asp Ile
 210 215 220
 Gln Lys Thr Ile Gln Met Val Arg Ala Gln Arg Ser Gly Met Val Gln
 225 230 235 240
 Thr Glu Ala Gln Tyr Lys Phe Ile Tyr Val Ala Ile Ala Gln Phe Ile
 245 250 255
 Glu Thr Thr Lys Lys Lys Leu Val Ile Asp Met Leu Met Glu Asn Ile
 260 265 270
 Ser Thr Lys Gly Leu Asp Cys Asp Ile Asp Ile Gln Lys Thr Ile Gln
 275 280 285
 Met Val Arg Ala Gln Arg Ser Gly Met Val Gln Thr Glu Ala Gln Tyr
 290 295 300
 Lys Phe Ile Tyr Val Ala Ile Ala Gln Phe Ile Glu Thr Thr Lys Lys
 305 310 315 320
 Lys Leu

<210> 15
 <211> 310
 <212> PRT
 <213> Homo sapiens

<400> 15

Asn	Gln	Ser	Cys	Asp	Ile	Ala	Leu	Leu	Pro	Glu	Asn	Arg	Gly	Lys	Asn
1			5						10					15	
Arg	Tyr	Asn	Asn	Ile	Leu	Pro	Tyr	Asp	Ala	Thr	Arg	Val	Lys	Leu	Ser
		20						25					30		
Asn	Val	Asp	Asp	Asp	Pro	Cys	Ser	Asp	Tyr	Ile	Asn	Ala	Ser	Tyr	Ile
	35						40					45			
Pro	Gly	Asn	Asn	Phe	Arg	Arg	Glu	Tyr	Ile	Val	Thr	Gln	Gly	Pro	Leu
	50					55					60				
Pro	Gly	Thr	Lys	Asp	Asp	Phe	Trp	Lys	Met	Val	Trp	Gln	Gln	Asn	Val
65				70					75					80	
His	Asn	Ile	Val	Met	Val	Thr	Gln	Tyr	Val	Gln	Lys	Gly	Arg	Val	Lys
			85					90						95	
Cys	Asp	His	Tyr	Trp	Pro	Ala	Asp	Gln	Asp	Ser	Leu	Tyr	Tyr	Gly	Asp
	100						105							110	
Leu	Ile	Leu	Gln	Met	Leu	Ser	Glu	Ser	Val	Leu	Pro	Glu	Trp	Thr	Ile
	115						120					125			
Phe	Lys	Ile	Cys	Gly	Glu	Gln	Gln	Leu	Asp	Ala	His	Arg	Leu	Ile	Arg
	130					135						140			
His	Phe	His	Tyr	Thr	Val	Trp	Pro	Asp	His	Gly	Val	Pro	Glu	Thr	Thr
145					150					155					160
Gln	Ser	Leu	Ile	Gln	Phe	Val	Arg	Thr	Val	Arg	Asp	Tyr	Ile	Asn	Arg
			165					170						175	
Ser	Pro	Gly	Ala	Gly	Pro	Thr	Val	Val	His	Cys	Ser	Ala	Gly	Val	Gly
	180						185							190	
Arg	Thr	Gly	Thr	Phe	Ile	Ala	Leu	Asp	Arg	Ile	Leu	Gln	Gln	Leu	Asp
	195						200					205			
Ser	Lys	Asp	Ser	Val	Asp	Ile	Tyr	Gly	Ala	Val	His	Asp	Leu	Arg	Leu
	210					215					220				
His	Arg	Val	His	Met	Val	Gln	Thr	Glu	Cys	Gln	Tyr	Val	Tyr	Leu	His
225					230					235					240
Gln	Cys	Val	Arg	Asp	Val	Leu	Arg	Ala	Arg	Lys	Leu	Arg	Ser	Ala	Leu
			245					250						255	
Asp	Arg	Ile	Leu	Gln	Gln	Leu	Asp	Ser	Lys	Asp	Ser	Val	Asp	Ile	Tyr
		260					265						270		
Gly	Ala	Val	His	Asp	Leu	Arg	Leu	His	Arg	Val	His	Met	Val	Gln	Thr
	275					280					285				
Glu	Cys	Gln	Tyr	Val	Tyr	Leu	His	Gln	Cys	Val	Arg	Asp	Val	Leu	Arg
	290					295						300			
Ala	Arg	Lys	Leu	Arg	Ser										
305					310										

<210> 16
 <211> 309
 <212> PRT
 <213> Drosophila melanogaster

<400> 16

Asp Gln Pro Cys Thr Phe Ala Asp Leu Pro Cys Asn Arg Pro Lys Asn
 1 5 10 15
 Arg Phe Thr Asn Ile Leu Pro Tyr Asp His Ser Arg Phe Lys Leu Gln
 20 25 30
 Pro Val Asp Asp Asp Glu Gly Ser Asp Tyr Ile Asn Ala Asn Tyr Val
 35 40 45
 Pro Gly His Asn Ser Pro Arg Glu Phe Ile Val Thr Gln Gly Pro Leu
 50 55 60
 His Ser Thr Arg Asp Asp Phe Trp Arg Met Cys Trp Glu Ser Asn Ser
 65 70 75 80
 Arg Ala Ile Val Met Leu Thr Arg Cys Phe Glu Lys Gly Arg Glu Lys
 85 90 95
 Cys Asp Gln Tyr Trp Pro Asn Asp Thr Val Pro Val Phe Tyr Gly Asp
 100 105 110
 Ile Lys Val Gln Ile Leu Asn Asp Ser His Tyr Ala Asp Trp Val Met
 115 120 125
 Phe Met Leu Cys Arg Gly Ser Glu Gln Arg Ile Leu Arg His Phe His
 130 135 140
 Phe Thr Thr Trp Pro Asp Phe Gly Val Pro Asn Pro Pro Gln Thr Leu
 145 150 155 160
 Val Arg Phe Val Arg Ala Phe Arg Asp Arg Ile Cys Ala Glu Gln Arg
 165 170 175
 Pro Ile Val Val His Cys Ser Ala Gly Val Gly Arg Ser Gly Thr Phe
 180 185 190
 Ile Thr Leu Asp Arg Ile Leu Gln Gln Ile Asn Thr Ser Asp Tyr Val
 195 200 205
 Asp Ile Phe Gly Ile Val Tyr Ala Met Arg Lys Glu Arg Val Trp Met
 210 215 220
 Val Gln Thr Glu Gln Gln Tyr Ile Cys Ile His Gln Cys Leu Leu Ala
 225 230 235 240
 Val Leu Glu Gly Lys Glu Asn Ile Val Gly Pro Thr Leu Asp Arg Ile
 245 250 255
 Leu Gln Gln Ile Asn Thr Ser Asp Tyr Val Asp Ile Phe Gly Ile Val
 260 265 270
 Tyr Ala Met Arg Glu Lys Arg Val Trp Met Val Gln Thr Glu Gln Gln
 275 280 285
 Tyr Ile Cys Ile His Gln Cys Leu Leu Ala Val Leu Glu Gly Lys Glu
 290 295 300
 Asn Ile Val Gly Pro
 305

<210> 17

<211> 313

<212> PRT

<213> Homo sapiens

<400> 17

Ser Gln Ser Gln Met Val Ala Ser Ala Ser Glu Asn Asn Ala Lys Asn
 1 5 10 15
 Arg Tyr Arg Asn Val Leu Pro Tyr Asp Trp Ser Arg Val Phe Leu Lys
 20 25 30
 Pro Ile His Glu Glu Pro Gly Ser Asp Tyr Ile Asn Ala Ser Phe Met
 35 40 45

Pro Gly Leu Trp Ser Pro Gln Glu Phe Ile Ala Thr Gln Gly Trp Leu
 50 55 60
 Pro Gln Thr Val Gly Asp Phe Trp Arg Leu Val Trp Glu Gln Gln Ser
 65 70 75 80
 His Thr Leu Val Met Leu Thr Asn Cys Met Glu Ala Gly Arg Val Lys
 85 90 95
 Cys Glu His Tyr Trp Pro Leu Asp Ser Gln Pro Cys Thr His Gly His
 100 105 110
 Leu Arg Val Thr Leu Val Gly Glu Glu Val Met Glu Asn Trp Thr Val
 115 120 125
 Leu Leu Leu Leu Gln Val Glu Glu Gln Lys Thr Leu Ser Val Arg Gln
 130 135 140
 Phe His Tyr Gln Ala Trp Pro Asp His Gly Val Pro Ser Ser Pro Asp
 145 150 155 160
 Thr Leu Leu Ala Phe Trp Arg Met Leu Arg Gln Trp Leu Asp Gln Thr
 165 170 175
 Met Glu Gly Gly Pro Pro Ile Val His Cys Ser Ala Gly Val Gly Arg
 180 185 190
 Thr Gly Thr Leu Ile Ala Leu Asp Val Leu Leu Arg Gln Leu Gln Ser
 195 200 205
 Glu Gly Leu Leu Gly Pro Phe Ser Phe Val Arg Lys Met Arg Glu Ser
 210 215 220
 Arg Pro Leu Met Val Gln Thr Glu Ala Gln Tyr Val Phe Leu His Gln
 225 230 235 240
 Cys Ile Cys Gly Ser Ser Asn Ser Gln Pro Arg Pro Gln Pro Arg Ala
 245 250 255
 Leu Asp Val Leu Leu Arg Gln Leu Gln Ser Glu Gly Leu Leu Gly Pro
 260 265 270
 Phe Ser Phe Val Arg Lys Met Arg Glu Ser Arg Pro Leu Met Val Gln
 275 280 285
 Thr Glu Ala Gln Tyr Val Phe Leu His Gln Cys Ile Cys Gly Ser Ser
 290 295 300
 Asn Ser Gln Pro Arg Pro Gln Pro Arg
 305 310

<10> 18

<11> 291

<12> PRT

<13> Rattus norvegicus

<400> 18

Phe Val Asp Pro Lys Glu Tyr Asp Ile Pro Gly Leu Val Arg Lys Asn
 1 5 10 15
 Arg Tyr Lys Thr Ile Leu Pro Asn Pro His Ser Arg Val Arg Leu Thr
 20 25 30
 Ser Pro Asp Pro Glu Asp Pro Leu Ser Ser Tyr Ile Asn Ala Asn Tyr
 35 40 45
 Ile Arg Gly Tyr Asn Gly Glu Lys Val Tyr Ile Ala Thr Gln Gly
 50 55 60
 Pro Ile Val Ser Thr Val Val Asp Phe Trp Arg Met Val Trp Glu Glu
 65 70 75 80
 Arg Thr Pro Ile Ile Val Met Ile Thr Asn Ile Glu Glu Met Asn Glu
 85 90 95
 Lys Cys Thr Glu Tyr Trp Pro Glu Glu Gln Val Val His Asp Gly Val

100 105 110
 Glu Ile Thr Val Gln Lys Val Ile His Thr Glu Asp Tyr Arg Leu Ile
 115 120 125
 Ser Leu Arg Arg Gly Thr Glu Glu Arg Gly Leu Lys His Tyr Trp Phe
 130 135 140
 Thr Ser Trp Pro Asp Gln Lys Thr Pro Asp Arg Ala Pro Pro Leu Leu
 145 150 155 160
 His Leu Val Arg Glu Val Glu Glu Ala Ala Gln Gln Glu Gly Pro His
 165 170 175
 Cys Ser Pro Ile Ile Val His Cys Ser Ala Gly Ile Gly Arg Thr Gly
 180 185 190
 Cys Phe Ile Ala Thr Ser Ile Cys Cys Gln Gln Leu Arg Arg Glu Gly
 195 200 205
 Val Val Asp Ile Leu Lys Thr Thr Cys Gln Leu Arg Gln Asp Arg Gly
 210 215 220
 Gly Met Ile Gln Thr Cys Glu Gln Tyr Gln Phe Val His His Ala Met
 225 230 235 240
 Ser Leu Tyr Ala Thr Ser Ile Cys Cys Gln Gln Leu Arg Arg Glu Gly
 245 250 255
 Val Val Asp Ile Leu Lys Thr Thr Cys Gln Leu Arg Gln Asp Arg Gly
 260 265 270
 Gly Met Ile Gln Thr Cys Glu Gln Tyr Gln Phe Val His His Ala Met
 275 280 285
 Ser Leu Tyr
 290

<210> 19

<211> 313

<212> PRT

<213> *Drosophila melanogaster*

<400> 19

Asp Arg Thr Thr Lys Asn Ser Asp Leu Lys Glu Asn Ala Cys Lys Asn
 1 5 10 15
 Arg Tyr Pro Asp Ile Lys Ala Tyr Asp Gln Thr Arg Val Lys Leu Ala
 20 25 30
 Val Ile Asn Gly Leu Gln Thr Thr Asp Tyr Ile Asn Ala Asn Phe Val
 35 40 45
 Ile Gly Tyr Lys Glu Arg Lys Lys Phe Ile Cys Ala Gln Gly Pro Met
 50 55 60
 Glu Ser Thr Ile Asp Asp Phe Trp Arg Met Ile Trp Glu Gln His Leu
 65 70 75 80
 Glu Ile Ile Val Ile Leu Thr Asn Leu Glu Glu Tyr Asn Lys Ala Lys
 85 90 95
 Cys Ala Lys Tyr Trp Pro Glu Lys Val Phe Asp Thr Lys Gln Phe Gly
 100 105 110
 Asp Ile Leu Val Lys Phe Ala Gln Glu Arg Lys Thr Gly Asp Tyr Ile
 115 120 125
 Glu Leu Asn Val Ser Lys Asn Lys Ala Asn Val Gly Glu Glu Asp
 130 135 140
 Arg Arg Gln Ile Thr Gln Tyr His Tyr Leu Thr Trp Lys Asp Phe Met
 145 150 155 160
 Ala Pro Glu His Pro His Gly Ile Ile Lys Phe Ile Arg Gln Ile Asn
 165 170 175

Ser Val Tyr Ser Leu Gln Arg Gly Pro Ile Leu Val His Cys Ser Ala
 180 185 190
 Gly Val Gly Arg Thr Gly Thr Leu Val Ala Leu Asp Ser Leu Ile Gln
 195 200 205
 Gln Leu Glu Glu Glu Asp Ser Val Ser Ile Tyr Asn Thr Val Cys Asp
 210 215 220
 Leu Arg His Gln Arg Asn Phe Leu Val Gln Ser Leu Lys Gln Tyr Ile
 225 230 235 240
 Phe Leu Tyr Arg Ala Leu Leu Asp Thr Gly Thr Phe Gly Asn Thr Asp
 245 250 255
 Ile Ala Leu Asp Ser Leu Ile Gln Gln Leu Glu Glu Glu Asp Ser Val
 260 265 270
 Ser Ile Tyr Asn Thr Val Cys Asp Leu Arg His Gln Arg Asn Phe Leu
 275 280 285
 Val Gln Ser Leu Lys Gln Tyr Ile Phe Leu Tyr Arg Ala Leu Leu Asp
 290 295 300
 Thr Gly Thr Phe Gly Asn Thr Asp Ile
 305 310

<210> 20

<211> 307

<212> PRT

<213> Homo sapiens

<400> 20

Val Gly Thr Phe His Cys Ser Met Ser Pro Gly Asn Leu Glu Lys Asn
 1 5 10 15
 Arg Tyr Gly Asp Val Pro Cys Leu Asp Gln Thr Arg Val Lys Leu Thr
 20 25 30
 Lys Arg Ser Gly His Thr Gln Thr Asp Tyr Ile Asn Ala Ser Phe Met
 35 40 45
 Asp Gly Tyr Lys Gln Lys Asn Ala Tyr Ile Gly Thr Gln Gly Pro Leu
 50 55 60
 Glu Asn Thr Tyr Arg Asp Phe Trp Leu Met Val Trp Glu Gln Lys Val
 65 70 75 80
 Leu Val Ile Val Met Thr Thr Arg Phe Glu Glu Gly Gly Arg Arg Lys
 85 90 95
 Cys Gly Gln Tyr Trp Pro Leu Glu Lys Asp Ser Arg Ile Arg Phe Gly
 100 105 110
 Phe Leu Thr Val Thr Asn Leu Gly Val Glu Asn Met Asn His Tyr Lys
 115 120 125
 Lys Leu Glu Ile His Asn Thr Glu Glu Arg Gln Lys Arg Gln Val Thr
 130 135 140
 His Phe Gln Phe Leu Ser Trp Pro Asp Tyr Gly Val Pro Ser Ser Ala
 145 150 155 160
 Ala Ser Leu Ile Asp Phe Leu Arg Val Val Arg Asn Gln Gln Ser Leu
 165 170 175
 Ala Val Ser Asn Met Gly Ala Arg Ser Lys Gly Gln Cys Pro Glu Pro
 180 185 190
 Pro Ile Val Val His Cys Ser Ala Gly Ile Gly Arg Thr Gly Thr Phe
 195 200 205
 Cys Ser Leu Asp Ile Cys Leu Ala Gln Leu Glu Glu Leu Gly Thr Leu
 210 215 220
 Asn Val Phe Gln Thr Val Ser Arg Met Arg Thr Gln Arg Ala Phe Ser

225 230 235 240
 Ile Gln Thr Pro Glu Gln Tyr Tyr Phe Cys Tyr Lys Ala Ile Leu Glu
 245 250 255
 Phe Ala Ser Leu Asp Ile Cys Leu Ala Gln Leu Glu Glu Leu Gly Thr
 260 265 270
 Leu Asn Val Phe Gln Thr Val Ser Arg Met Arg Thr Gln Arg Ala Phe
 275 280 285
 Ser Ile Gln Thr Pro Glu Gln Tyr Tyr Phe Cys Tyr Lys Ala Ile Leu
 290 295 300
 Glu Phe Ala
 305

<210> 21
 <211> 312
 <212> PRT
 <213> Homo sapiens

<400> 21
 1 5 10 15
 Arg Tyr Lys Asp Ile Leu Pro Phe Asp His Ser Arg Val Lys Leu Thr
 20 25 30
 Leu Lys Thr Pro Ser Gln Asp Ser Asp Tyr Ile Asn Ala Asn Phe Ile
 35 40 45
 Lys Gly Val Tyr Gly Pro Lys Ala Tyr Val Ala Thr Gln Gly Pro Leu
 50 55 60
 Ala Asn Thr Val Ile Asp Phe Trp Arg Met Val Trp Glu Tyr Asn Val
 65 70 75 80
 Val Ile Ile Val Met Ala Cys Arg Glu Phe Glu Met Gly Arg Lys Lys
 85 90 95
 Cys Glu Arg Tyr Trp Pro Leu Tyr Gly Glu Asp Pro Ile Thr Phe Ala
 100 105 110
 Pro Phe Lys Ile Ser Cys Glu Asp Glu Gln Ala Arg Thr Asp Tyr Phe
 115 120 125
 Ile Leu Leu Leu Glu Phe Gln Asn Glu Ser Arg Arg Leu Tyr Gln Phe
 130 135 140
 His Tyr Val Asn Trp Pro Asp His Asp Val Pro Ser Ser Phe Asp Ser
 145 150 155 160
 Ile Leu Asp Met Ile Ser Leu Met Arg Lys Tyr Gln Glu His Glu Asp
 165 170 175
 Val Pro Ile Cys Ile His Cys Ser Ala Gly Cys Gly Arg Thr Gly Ala
 180 185 190
 Ile Cys Ala Ile Asp Tyr Thr Trp Asn Leu Leu Lys Ala Gly Lys Ile
 195 200 205
 Pro Glu Glu Phe Asn Val Phe Asn Leu Ile Gln Glu Met Arg Thr Gln
 210 215 220
 Arg His Ser Ala Val Gln Thr Lys Glu Gln Tyr Glu Leu Val His Arg
 225 230 235 240
 Ala Ile Ala Gln Leu Phe Glu Lys Gln Leu Gln Leu Tyr Ala Ile Asp
 245 250 255
 Tyr Thr Trp Asn Leu Leu Lys Ala Gly Lys Ile Pro Glu Glu Phe Asn
 260 265 270
 Val Phe Asn Leu Ile Gln Glu Met Arg Thr Gln Arg His Ser Ala Val
 275 280 285

Gln Thr Lys Gln Gln Tyr Glu Leu Val His Arg Ala Ile Ala Gln Leu
 290 295 300
 Phe Glu Lys Gln Leu Gln Leu Tyr
 305 310

<210> 22

<211> 291

<212> PRT

<213> Homo sapiens

<400> 22

Gly Leu Ala Ile Thr Phe Ala Lys Leu Pro Gln Asn Leu Asp Lys Asn
 1 5 10 15
 Arg Tyr Lys Asp Val Leu Pro Tyr Asp Thr Thr Arg Val Leu Leu Gln
 20 25 30
 Gly Asn Glu Asp Tyr Ile Asn Ala Ser Tyr Val Asn Met Glu Ile Pro
 35 40 45
 Ala Ala Asn Leu Val Asn Lys Tyr Ile Ala Thr Gln Gly Pro Leu Pro
 50 55 60
 His Thr Cys Ala Gln Phe Thr Gln Val Val Trp Asp Gln Lys Leu Ser
 65 70 75 80
 Leu Ile Val Met Leu Thr Thr Leu Thr Glu Arg Gly Arg Thr Lys Cys
 85 90 95
 His Gln Tyr Trp Pro Asp Pro Pro Asp Val Met Asn His Gly Gly Phe
 100 105 110
 His Ile Gln Cys Gln Ser Glu Asp Cys Thr Ile Ala Tyr Val Ser Met
 115 120 125
 Leu Val Thr Asn Thr Gln Thr Gly Glu Glu His Thr Val Thr His Leu
 130 135 140
 Gln Tyr Val Ala Trp Pro Asp His Gly Ile Pro Asp Asp Ser Ser Asp
 145 150 155 160
 Phe Leu Glu Phe Val Asn Tyr Val Arg Ser Leu Arg Val Asp Ser Glu
 165 170 175
 Pro Val Leu Val His Cys Ser Ala Gly Ile Gly Arg Thr Gly Val Leu
 180 185 190
 Val Thr Met Glu Thr Ala Met Cys Leu Thr Glu Arg Asn Leu Pro Ile
 195 200 205
 Tyr Pro Leu Asp Ile Val Arg Lys Met Arg Asp Gln Arg Ala Met Met
 210 215 220
 Val Gln Thr Ser Ser Gln Tyr Lys Phe Val Cys Glu Ala Ile Leu Arg
 225 230 235 240
 Val Tyr Thr Met Glu Thr Ala Met Cys Leu Thr Glu Arg Asn Leu Pro
 245 250 255
 Ile Tyr Pro Leu Asp Ile Val Arg Lys Met Arg Asp Gln Arg Ala Met
 260 265 270
 Met Val Gln Thr Ser Ser Gln Tyr Lys Phe Val Cys Glu Ala Ile Leu
 275 280 285
 Arg Val Tyr
 290

<210> 23

<211> 341

<212> PRT

<213> Bityx zealandica

<400> 23

Pro Ser Glu Thr Ser Glu Gly Asp Lys Lys His Asn Thr Ser Lys Asn
 1 5 10 15
 Arg Tyr Thr Asn Ile Leu Pro Val Asn His Thr Arg Val Gln Leu Lys
 20 25 30
 Lys Ile Gln Asp Lys Glu Gly Ser Asp Tyr Ile Asn Ala Asn Tyr Ile
 35 40 45
 Asp Gly Ala Tyr Pro Lys Gln Phe Ile Cys Thr Gln Gly Pro Leu Pro
 50 55 60
 Asn Thr Ile Ala Asp Phe Trp Arg Met Val Trp Glu Asn Arg Cys Arg
 65 70 75 80
 Ile Ile Val Met Leu Ser Arg Glu Ser Glu Gly Ser Glu Asn Cys Arg
 85 90 95
 Ile Lys Cys Asp Arg Tyr Trp Pro Gln Gln Ile Gly Gly Glu Gln Phe
 100 105 110
 Ser Ile Tyr Gly Asn Gly Asn Glu Val Phe Gly Thr Tyr Ser Val Glu
 115 120 125
 Leu Val Glu Val Ile Gln Cys Arg Glu Ile Ile Thr Arg Asn Ile Arg
 130 135 140
 Leu Thr Phe Glu Gly Glu Thr Arg Asp Ile Thr Gln Tyr Gln Tyr Glu
 145 150 155 160
 Gly Trp Pro Asp His Asn Ile Pro Asp His Thr Gln Pro Phe Arg Gln
 165 170 175
 Leu Leu His Ser Ile Thr Asn Arg Gln Asn Gln Ile Ile Pro Ser Ser
 180 185 190
 Asp Arg Asn Val Pro Ile Ile Val His Cys Ser Ala Gly Val Gly Arg
 195 200 205
 Thr Gly Thr Phe Cys Thr Ala Val Ile Met Met Lys Lys Leu Asp His
 210 215 220
 Tyr Phe Lys Gln Leu Asp Tyr Asn Ser Arg Ile Asp Phe Asn Leu Phe
 225 230 235 240
 Ser Ile Val Leu Lys Leu Arg Glu Gln Arg Pro Gly Met Val Gln Gln
 245 250 255
 Leu Glu Gln Tyr Leu Phe Cys Tyr Lys Thr Ile Leu Asp Glu Ile Tyr
 260 265 270
 His Arg Leu Asn Cys Thr Ala Val Ile Met Met Lys Lys Leu Asp His
 275 280 285
 Tyr Phe Lys Gln Leu Asp Tyr Asn Ser Arg Ile Asp Phe Asn Leu Phe
 290 295 300
 Ser Ile Val Leu Lys Leu Arg Glu Gln Arg Pro Gly Met Val Gln Gln
 305 310 315 320
 Leu Glu Gln Tyr Leu Phe Cys Tyr Lys Thr Ile Leu Asp Glu Ile Tyr
 325 330 335
 His Arg Leu Asn Cys
 340

<210> 24

<211> 312

<212> PRT

<213> Schizosaccharomyces pombe

<400> 24

Gln Trp Ser Thr Val Arg Ser Leu Ser Asn Thr Ser Tyr Lys Lys Asn

1 5 10 15
 Arg Tyr Thr Asp Ile Val Pro Tyr Asn Cys Thr Arg Val His Leu Lys
 20 25 30
 Arg Thr Ser Pro Ser Glu Leu Asp Tyr Ile Asn Ala Ser Phe Ile Lys
 35 40 45
 Thr Glu Thr Ser Asn Tyr Ile Ala Cys Gln Gly Ser Ile Ser Arg Ser
 50 55 60
 Ile Ser Asp Phe Trp His Met Val Trp Asp Asn Val Glu Asn Ile Gly
 65 70 75 80
 Thr Ile Val Met Leu Gly Ser Leu Phe Glu Ala Gly Arg Glu Met Cys
 85 90 95
 Thr Ala Tyr Trp Pro Ser Asn Gly Ile Gly Asp Lys Gln Val Tyr Gly
 100 105 110
 Asp Tyr Cys Val Lys Gln Ile Ser Glu Glu Asn Val Asp Asn Ser Arg
 115 120 125
 Phe Ile Leu Phe Glu Ile Gln Asn Ala Asn Phe Pro Ser Val Lys Lys
 130 135 140
 Val His His Tyr Gln Tyr Pro Asn Trp Ser Asp Cys Asn Ser Pro Glu
 145 150 155
 Asn Val Lys Ser Met Val Glu Phe Leu Lys Tyr Val Asn Asn Ser His
 165 170 175
 Gly Ser Gly Asn Thr Ile Val His Cys Ser Ala Gly Val Gly Arg Thr
 180 185 190
 Gly Thr Phe Ile Val Leu Asp Thr Ile Leu Arg Phe Pro Glu Ser Lys
 195 200 205
 Leu Ser Gly Phe Asn Pro Ser Val Ala Asp Ser Ser Asp Val Val Phe
 210 215 220
 Gln Leu Val Asp His Ile Arg Lys Gln Arg Met Lys Met Val Gln Thr
 225 230 235 240
 Phe Thr Gln Phe Lys Tyr Val Tyr Asp Leu Ile Asp Ser Leu Val Leu
 245 250 255
 Asp Thr Ile Leu Arg Phe Pro Glu Ser Lys Leu Ser Gly Phe Asn Pro
 260 265 270
 Ser Val Ala Asp Ser Ser Asp Val Val Phe Gln Leu Val Asp His Ile
 275 280 285
 Arg Lys Gln Arg Met Lys Met Val Gln Thr Phe Thr Gln Phe Lys Tyr
 290 295 300
 Val Tyr Asp Leu Ile Asp Ser Leu
 305 310

<210> 25

<211> 307

<212> PRT

<213> Schizosaccharomyces pombe

<400> 25

Trp Cys Cys Leu Ala Ser Ser Arg Ser Thr Ser Ile Ser Arg Lys Asn
 1 5 10 15
 Arg Tyr Thr Asp Ile Val Pro Tyr Asp Lys Thr Arg Val Arg Leu Ala
 20 25 30
 Val Pro Lys Gly Cys Ser Asp Tyr Ile Asn Ala Ser His Ile Asp Val
 35 40 45
 Gly Asn Lys Lys Tyr Ile Ala Cys Gln Ala Pro Lys Pro Gly Thr Leu
 50 55 60

Leu Asp Phe Trp Glu Met Val Trp His Asn Ser Gly Thr Asn Gly Val
 65 70 75 80
 Ile Val Met Leu Thr Asn Leu Tyr Glu Ala Gly Ser Glu Lys Cys Ser
 85 90 95
 Gln Tyr Trp Pro Asp Asn Lys Asp His Ala Leu Cys Leu Glu Gly Gly
 100 105 110
 Leu Arg Ile Ser Val Gln Lys Tyr Glu Thr Phe Glu Asp Leu Lys Val
 115 120 125
 His Leu Phe Arg Leu Asp Lys Pro Asn Gly Pro Pro Lys Tyr Ile His
 130 135 140
 His Phe Trp Val His Thr Trp Phe Asp Lys Thr His Pro Asp Ile Glu
 145 150 155 160
 Ser Ile Thr Gly Leu Ile Arg Cys Ile Asp Lys Val Pro Asn Asp Gly
 165 170 175
 Pro Met Phe Val His Cys Ser Ala Gly Val Gly Arg Thr Gly Thr Phe
 180 185 190
 Ile Ala Val Asp Gln Ile Leu Gln Val Pro Lys Asn Ile Leu Pro Lys
 195 200 205
 Thr Thr Asn Leu Glu Asp Ser Lys Asp Phe Ile Phe Asn Cys Val Asn
 210 215 220
 Ser Leu Arg Ser Gln Arg Met Lys Met Val Gln Asn Phe Glu Gln Phe
 225 230 235 240
 Lys Phe Leu Tyr Asp Val Val Asp Tyr Leu Ala Val Asp Gln Ile Leu
 245 250 255
 Gln Val Pro Lys Asn Ile Leu Pro Lys Thr Thr Asn Leu Glu Asp Ser
 260 265 270
 Lys Asp Phe Ile Phe Asn Cys Val Asn Ser Leu Arg Ser Gln Arg Met
 275 280 285
 Lys Met Val Gln Asn Phe Glu Gln Phe Lys Phe Leu Tyr Asp Val Val
 290 295 300
 Asp Tyr Leu
 305

<210> 26

<211> 316

<212> PRT

<213> Homo sapiens

<400> 26

Gly Ile Thr Ala Asp Ser Ser Asn His Pro Asp Asn Lys His Lys Asn
 1 5 10 15
 Arg Tyr Ile Asn Ile Val Ala Tyr Asp His Ser Arg Val Lys Leu Ala
 20 25 30
 Gln Leu Ala Glu Lys Asp Gly Lys Leu Thr Asp Tyr Ile Asn Ala Asn
 35 40 45
 Tyr Val Asp Gly Tyr Asn Arg Pro Lys Ala Tyr Ile Ala Ala Gln Gly
 50 55 60
 Pro Leu Lys Ser Thr Ala Glu Asp Phe Trp Arg Met Ile Trp Glu His
 65 70 75 80
 Asn Val Glu Val Ile Val Met Ile Thr Asn Leu Val Glu Lys Gly Arg
 85 90 95
 Arg Lys Cys Asp Gln Tyr Trp Pro Ala Asp Gly Ser Glu Glu Tyr Gly
 100 105 110
 Asn Phe Leu Val Thr Gln Lys Ser Val Gln Val Leu Ala Tyr Tyr Thr

115 120 125
 Val Phe Thr Leu Arg Asn Thr Lys Ile Lys Lys Gly Ser Gln Lys Gly
 130 135 140
 Arg Pro Ser Gly Arg Val Val Thr Gln Tyr His Tyr Thr Gln Trp Pro
 145 150 155 160
 Asp Met Gly Val Pro Glu Tyr Ser Leu Pro Val Leu Thr Phe Val Arg
 165 170 175
 Lys Ala Ala Tyr Ala Lys Arg His Ala Val Gly Pro Val Val Val His
 180 185 190
 Cys Ser Ala Gly Val Gly Arg Thr Gly Thr Tyr Ile Val Leu Asp Ser
 195 200 205
 Met Leu Gln Gln Ile Gln His Glu Gly Thr Val Asn Ile Phe Gly Phe
 210 215 220
 Leu Lys His Ile Arg Ser Gln Arg Asn Tyr Leu Val Gln Thr Glu Glu
 225 230 235 240
 Gln Tyr Val Phe Ile His Asp Thr Leu Val Glu Ala Ile Leu Ser Lys
 245 250 255
 Gln Thr Glu Val Val Leu Asp Ser Met Leu Gln Gln Ile Gln His Glu
 260 265 270
 Gly Thr Val Asn Ile Phe Gly Phe Leu Lys His Ile Arg Ser Gln Arg
 275 280 285
 Asn Tyr Leu Val Gln Thr Glu Glu Gln Tyr Val Phe Ile His Asp Thr
 290 295 300
 Leu Val Glu Ala Ile Leu Ser Lys Glu Thr Glu Val
 305 310 315

<210> 27

<211> 294

<212> PRT

<213> Homo sapiens

<400> 27

Thr Ser Arg Phe Ile Ser Ala Asn Leu Pro Cys Asn Lys Phe Lys Asn
 1 5 10 15
 Arg Leu Val Asn Ile Met Pro Tyr Glu Leu Thr Arg Val Cys Leu Gln
 20 25 30
 Pro Ile Arg Gly Val Glu Gly Ser Asp Tyr Ile Asn Ala Ser Phe Leu
 35 40 45
 Asp Gly Tyr Arg Gln Gln Lys Ala Tyr Ile Ala Thr Gln Gly Pro Leu
 50 55 60
 Ala Glu Ser Thr Glu Asp Phe Trp Arg Met Leu Trp Glu His Asn Ser
 65 70 75 80
 Thr Ile Ile Val Met Leu Thr Lys Leu Arg Glu Met Gly Arg Glu Lys
 85 90 95
 Cys His Gln Tyr Trp Pro Ala Glu Arg Ser Ala Arg Tyr Gln Tyr Phe
 100 105 110
 Val Val Asp Pro Met Ala Glu Tyr Asn Met Pro Gln Tyr Ile Leu Phe
 115 120 125
 Lys Val Thr Asp Ala Arg Asp Gly Gln Ser Arg Thr Ile Arg Gln Phe
 130 135 140
 Gln Phe Thr Asp Trp Pro Glu Gln Gly Val Pro Lys Thr Gly Glu Gly
 145 150 155 160
 Phe Ile Asp Phe Ile Gly Gln Val His Lys Thr Lys Glu Gln Phe Gly
 165 170 175

Gln Asp Gly Pro Ile Thr Val His Cys Ser Ala Gly Val Gly Arg Thr
 180 185 190
 Gly Val Phe Ile Thr Leu Ser Ile Val Leu Glu Arg Met Arg Tyr Glu
 195 200 205
 Gly Val Val Asp Met Phe Gln Thr Val Lys Thr Leu Arg Thr Gln Arg
 210 215 220
 Pro Ala Met Val Gln Thr Glu Asp Gln Tyr Gln Leu Cys Tyr Arg Ala
 225 230 235 240
 Ala Leu Glu Tyr Leu Thr Leu Ser Ile Val Leu Glu Arg Met Arg Tyr
 245 250 255
 Gln Gly Val Val Asp Met Phe Gln Thr Val Lys Thr Leu Arg Thr Gln
 260 265 270
 Arg Pro Ala Met Val Gln Thr Glu Asp Gln Tyr Gln Leu Cys Tyr Arg
 275 280 285
 Ala Ala Leu Glu Tyr Leu
 290

<210> 28

<211> 281

<212> PRT

<213> Homo sapiens

<400> 28

Asn Asp Lys Met Arg Thr Gly Asn Leu Pro Ala Asn Met Lys Lys Asn
 1 5 10 15
 Arg Val Leu Gln Ile Ile Pro Tyr Glu Phe Asn Arg Val Ile Ile Pro
 20 25 30
 Val Lys Arg Gly Glu Asn Asp Lys Met Arg Thr Gly Asn Leu Pro Ala
 35 40 45
 Asn Met Lys Lys Asn Arg Val Leu Gln Ile Ile Pro Tyr Glu Phe Asn
 50 55 60
 Arg Val Ile Ile Pro Val Lys Arg Gly Glu Glu Asn Thr Asp Tyr Val
 65 70 75 80
 Asn Ala Ser Phe Ile Asp Gly Tyr Arg Gln Lys Asp Ser Tyr Ile Ala
 85 90 95
 Ser Gln Gly Pro Leu Leu His Thr Ile Glu Asp Phe Trp Arg Met Ile
 100 105 110
 Trp Glu Trp Lys Ser Cys Ser Ile Val Met Leu Thr Glu Leu Glu Glu
 115 120 125
 Arg Gly Gln Glu Lys Cys Ala Gln Tyr Trp Pro Ser Asp Gly Leu Val
 130 135 140
 Ser Tyr Gly Asp Ile Thr Val Glu Leu Lys Lys Glu Glu Glu Cys Glu
 145 150 155 160
 Ser Tyr Thr Val Leu Leu Val Thr Asn Thr Arg Glu Asn Lys Ser Arg
 165 170 175
 Gln Ile Arg Gln Phe His Phe His Gly Trp Pro Glu Val Gly Ile Pro
 180 185 190
 Ser Asp Gly Lys Gly Met Ile Ser Ile Ile Ala Ala Val Gln Lys Gln
 195 200 205
 Gln Gln Gln Ser Gly Asn His Pro Ile Thr Val His Cys Ser Ala Gly
 210 215 220
 Ala Gly Arg Thr Gly Thr Phe Cys Ala Leu Ser Thr Val Leu Glu Arg
 225 230 235 240
 Val Lys Ala Glu Gly Ile Leu Asp Val Phe Gln Thr Val Lys Ser Leu

245 250 255
 Arg Leu Gln Arg Pro His Met Val Gln Thr Leu Glu Gln Tyr Glu Phe
 260 265 270
 Cys Tyr Lys Val Val Gln Glu Tyr Ile
 275 280

<210> 29
 <211> 298
 <212> PRT
 <213> Homo sapiens

<400> 29
 Lys Glu Asn Met Arg Thr Gly Asn Leu Pro Ala Asn Met Lys Lys Ala
 5 10 15
 Arg Val Ile Gln Ile Ile Pro Tyr Asp Phe Asn Arg Val Ile Leu Ser
 20 25 30
 Met Lys Arg Gly Gln Glu Tyr Thr Asp Tyr Ile Asn Ala Ser Phe Ile
 35 40 45
 Asp Gly Tyr Arg Gln Lys Asp Tyr Phe Ile Ala Thr Gln Gly Pro Leu
 50 55 60
 Ala His Thr Val Glu Asp Phe Trp Arg Met Ile Trp Glu Trp Lys Ser
 65 70 75 80
 His Thr Ile Val Met Leu Thr Glu Val Gln Glu Arg Glu Gln Asp Lys
 85 90 95
 Cys Tyr Gln Tyr Trp Pro Thr Glu Gly Ser Val Thr His Gly Glu Ile
 100 105 110
 Thr Ile Glu Ile Lys Asn Asp Thr Leu Ser Glu Ala Ile Ser Ile Phe
 115 120 125
 Leu Val Thr Leu Asn Gln Pro Gln Ala Arg Gln Glu Glu Gln Val Arg
 130 135 140
 Val Val Arg Gln Phe His Phe His Gly Trp Pro Glu Ile Gly Ile Pro
 145 150 155 160
 Ala Glu Gly Lys Gly Met Ile Asp Leu Ile Ala Ala Val Gln Lys Gln
 165 170 175
 Gln Gln Gln Thr Gly Asn His Pro Ile Thr Val His Cys Ser Ala Gly
 180 185 190
 Ala Gly Arg Thr Gly Thr Phe Ile Ala Leu Ser Asn Ile Leu Glu Arg
 195 200 205
 Val Lys Ala Glu Gly Leu Leu Asp Val Phe Gln Ala Val Lys Ser Leu
 210 215 220
 Arg Leu Gln Arg Pro His Met Val Gln Thr Leu Glu Gln Tyr Glu Phe
 225 230 235 240
 Cys Tyr Lys Val Val Gln Asp Phe Ile Ala Leu Ser Asn Ile Leu Glu
 245 250 255
 Arg Val Lys Ala Glu Gly Leu Leu Asp Val Phe Gln Ala Val Lys Ser
 260 265 270
 Leu Arg Leu Gln Arg Pro His Met Val Gln Thr Leu Glu Gln Tyr Glu
 275 280 285
 Phe Cys Tyr Lys Val Val Gln Asp Phe Ile
 290 295

<210> 30
 <211> 301
 <212> PRT

<213> Homo sapiens

<406> 30

Val Glu Asp Cys Ser Ile Ala Leu Leu Pro Arg Asn His Glu Lys Asn
 1 5 10 15
 Arg Cys Met Asp Ile Leu Pro Pro Asp Arg Cys Leu Pro Phe Leu Ile
 20 25 30
 Thr Ile Asp Gly Glu Ser Ser Asn Tyr Ile Asn Ala Ala Leu Met Asp
 35 40 45
 Ser Tyr Lys Gln Pro Ser Ala Phe Ile Val Thr Gln His Pro Leu Pro
 50 55 60
 Asn Thr Val Lys Asp Phe Trp Arg Leu Val Leu Asp Tyr His Cys Thr
 65 70 75 80
 Ser Val Val Met Leu Asn Asp Val Asp Pro Ala Gln Leu Cys Pro Gln
 85 90 95
 Tyr Trp Pro Glu Asn Gly Val His Arg His Gly Pro Ile Gln Val Glu
 100 105 110
 Phe Val Ser Ala Asp Leu Glu Glu Asp Ile Ile Ser Phe Arg Ile Tyr
 115 120 125
 Asn Ala Ala Arg Pro Gln Asp Gly Tyr Arg Met Val Gln Gln Phe Gln
 130 135 140
 Phe Leu Gly Trp Pro Met Tyr Arg Asp Thr Pro Val Ser Lys Arg Ser
 145 150 155 160
 Phe Leu Lys Leu Ile Arg Gln Val Asp Lys Trp Gln Glu Glu Tyr Asn
 165 170 175
 Gly Gly Glu Gly Pro Thr Val Val His Cys Leu Asn Gly Gly Gly Arg
 180 185 190
 Ser Gly Thr Phe Cys Ala Ile Ser Ile Val Cys Glu Met Leu Arg His
 195 200 205
 Gln Arg Thr Val Asp Val Phe His Ala Val Lys Thr Leu Arg Asn Asn
 210 215 220
 Lys Pro Asn Met Val Asp Leu Leu Asp Gln Tyr Lys Phe Cys Tyr Glu
 225 230 235 240
 Val Ala Leu Glu Tyr Leu Asn Ser Gly Ala Ile Ser Ile Val Cys Glu
 245 250 255
 Met Leu Arg His Gly Arg Thr Val Asp Val Phe His Ala Val Lys Thr
 260 265 270
 Leu Arg Asn Asn Lys Pro Asn Met Val Asp Leu Leu Asp Gln Tyr Lys
 275 280 285
 Phe Cys Tyr Glu Val Ala Leu Glu Tyr Leu Asn Ser Gly
 290 295 300

<210> 31

<211> 333

<212> IRT

<213> Mus musculus

<406> 31

Trp Arg Thr Glu His Ile Gly Asn Gln Glu Glu Asn Lys Lys Lys Asn
 1 5 10 15
 Arg Asn Ser Asn Val Val Pro Tyr Asp Phe Asn Arg Val Pro Leu Lys
 20 25 30
 His Glu Leu Glu Met Ser Lys Glu Ser Glu Pro Glu Ser Asp Glu Ser
 35 40 45

Ser Asp Asp Asp Ser Asp Ser Glu Glu Thr Ser Lys Tyr Ile Asn Ala
 50 55 60
 Ser Phe Val Met Ser Tyr Trp Lys Pro Glu Met Met Ile Ala Ala Gln
 65 70 75 80
 Gly Pro Leu Lys Glu Thr Ile Gly Asp Phe Trp Gln Met Ile Phe Gln
 85 90 95
 Arg Lys Val Lys Val Ile Val Met Leu Thr Glu Leu Val Asn Gly Asp
 100 105 110
 Gln Glu Val Cys Ala Gln Tyr Trp Gly Glu Gly Lys Gln Thr Tyr Gly
 115 120 125
 Asp Met Glu Val Glu Met Lys Asp Thr Asn Arg Ala Ser Ala Tyr Thr
 130 135 140
 Leu Phe Glu Leu Arg His Ser Lys Arg Lys Glu Pro Arg Thr Val Tyr
 145 150 155 160
 Gln Tyr Gln Cys Thr Thr Trp Lys Gly Glu Glu Leu Pro Ala Glu Pro
 165 170 175
 Lys Asp Leu Val Ser Met Ile Gln Asp Leu Lys Gln Lys Leu Pro Lys
 180 185 190
 Ala Ser Pro Glu Gly Met Lys Tyr His Lys His Ala Ser Ile Leu Val
 195 200 205
 His Cys Arg Asp Gly Ser Gln Gln Thr Gly Leu Phe Cys Ala Leu Phe
 210 215 220
 Asn Leu Leu Glu Ser Ala Glu Thr Glu Asp Val Val Asp Val Phe Gln
 225 230 235 240
 Val Val Lys Ser Leu Arg Lys Ala Arg Pro Gly Val Val Cys Ser Tyr
 245 250 255
 Glu Gln Tyr Gln Phe Leu Tyr Asp Ile Ile Ala Ser Ile Tyr Pro Ala
 260 265 270
 Gln Asn Gly Gln Val Ala Leu Phe Asn Leu Leu Glu Ser Ala Glu Thr
 275 280 285
 Glu Asp Val Val Asp Val Phe Gln Val Val Lys Ser Leu Arg Lys Ala
 290 295 300
 Arg Pro Gly Val Val Cys Ser Tyr Glu Gln Tyr Gln Phe Leu Tyr Asp
 305 310 315 320
 Ile Ile Ala Ser Ile Tyr Pro Ala Gln Asn Gly Gln Val
 325 330

<210> 32

<211> 295

<212> PRT

<213> Drosophila melanogaster

<400> 32

Ser Lys Ser Cys Ser Val Gly Glu Asn Glu Glu Asn Asn Met Lys Asn
 1 5 10 15
 Arg Ser Gln Glu Ile Ile Pro Tyr Asp Arg Asn Arg Val Ile Leu Thr
 20 25 30
 Pro Leu Pro Met Arg Glu Asn Ser Phe Tyr Ile Asn Ala Ser Phe Ile
 35 40 45
 Glu Gly Tyr Asp Asn Ser Glu Thr Phe Ile Ile Ala Gln Asp Pro Phe
 50 55 60
 Glu Asn Thr Ile Gly Asp Phe Trp Arg Met Ile Ser Glu Gln Ser Val
 65 70 75 80
 Thr Thr Leu Val Met Ile Ser Glu Ile Gly Asp Gly Pro Arg Lys Cys

Pro	Arg	Tyr	Trp	Ala	Asp	Asp	Gln	Val	Gln	Tyr	Asp	His	Ile	Leu	Val
100							105						110		
Lys	Tyr	Val	His	Ser	Glu	Ser	Cys	Pro	Tyr	Tyr	Thr	Phe	Phe	Tyr	Val
115							120					125			
Thr	Asn	Cys	Lys	Ile	Asp	Asp	Thr	Leu	Lys	Val	Thr	Gln	Phe	Gln	Tyr
130							135				140				
Asn	Gly	Trp	Pro	Thr	Val	Asp	Gly	Glu	Val	Pro	Glu	Val	Cys	Arg	Gly
145					150					155					160
Ile	Ile	Glu	Leu	Val	Asp	Gln	Ala	Tyr	Asn	His	Tyr	Lys	Asn	Asn	Lys
			165						170						175
Asn	Ser	Gly	Cys	Arg	Ser	Pro	Leu	Thr	Val	His	Cys	Ser	Leu	Gly	Thr
		180						185					190		
Asp	Arg	Ser	Ser	Ile	Phe	Val	Ala	Met	Cys	Ile	Leu	Val	Gln	His	Leu
	195						200					205			
Arg	Leu	Glu	Lys	Cys	Val	Asp	Ile	Cys	Ala	Thr	Thr	Arg	Lys	Leu	Arg
210						215					220				
Ser	Gln	Arg	Thr	Gly	Leu	Ile	Asn	Ser	Tyr	Ala	Gln	Tyr	Glu	Phe	Leu
225					230					235					240
His	Arg	Ala	Ile	Ile	Asn	Tyr	Ala	Met	Cys	Ile	Leu	Val	Gln	His	Leu
			245						250						255
Arg	Leu	Glu	Lys	Cys	Val	Asp	Ile	Cys	Ala	Thr	Thr	Arg	Lys	Leu	Arg
		260					265						270		
Ser	Gln	Arg	Thr	Gly	Leu	Ile	Asn	Ser	Tyr	Ala	Gln	Tyr	Glu	Phe	Leu
	275						280					285			
His	Arg	Ala	Ile	Ile	Asn	Tyr									
	290					295									

<210> 33

<211> 398

<212> PRT

<213> Homo sapiens

<400> 33

Gln	Ser	Asp	Tyr	Ser	Ala	Ala	Leu	Lys	Gln	Cys	Asn	Arg	Glu	Lys	Asn
1				5					10					15	
Arg	Thr	Ser	Ser	Ile	Ile	Pro	Val	Glu	Arg	Ser	Arg	Val	Gly	Ile	Ser
		20						25					30		
Ser	Leu	Ser	Gly	Glu	Gly	Thr	Asp	Tyr	Ile	Asn	Ala	Ser	Tyr	Ile	Met
	35						40					45			
Gly	Tyr	Tyr	Gln	Ser	Asn	Glu	Phe	Ile	Ile	Thr	Gln	His	Pro	Leu	Leu
	50					55					60				
His	Thr	Ile	Lys	Asp	Phe	Trp	Arg	Met	Ile	Trp	Asp	His	Asn	Ala	Gln
65					70					75				80	
Leu	Val	Val	Met	Ile	Pro	Asp	Gly	Gln	Asn	Met	Ala	Gln	Asp	Glu	Phe
			85						90					95	
Val	Tyr	Trp	Pro	Asn	Lys	Asp	Glu	Pro	Ile	Asn	Cys	Glu	Ser	Phe	Lys
	100						105						110		
Val	Thr	Leu	Met	Ala	Ile	Gln	His	Lys	Cys	Leu	Ser	Asn	Glu	Glu	Lys
	115						120						125		
Leu	Ile	Ile	Phe	Ile	Leu	Glu	Ala	Thr	Gln	Asp	Asp	Tyr	Val	Leu	Glu
	130						135				140				
Val	Arg	His	Phe	Gln	Cys	Pro	Lys	Trp	Pro	Asn	Pro	Asp	Ser	Pro	Ile
145					150					155					160

Ser Lys Thr Phe Glu Leu Ile Ser Val Ile Lys Glu Glu Ala Ala Asn
 165 170 175
 Arg Asp Gly Pro Met Ile Val His Asp Glu His Gly Gly Val Thr Ala
 180 185 190
 Gly Thr Phe Cys Ala Leu Thr Thr Leu Met His Gln Leu Glu Lys Glu
 195 200 205
 Asn Ser Val Asp Val Tyr Gln Val Ala Lys Met Ile Asn Leu Met Arg
 210 215 220
 Pro Gly Val Phe Ala Asp Ile Glu Gln Tyr Gln Phe Leu Tyr Lys Val
 225 230 235 240
 Ile Leu Ser Leu Val Ser Thr Arg Gln Glu Glu Asn Ala Leu Thr Thr
 245 250 255
 Leu Met His Gln Leu Glu Lys Glu Asn Ser Val Asp Val Tyr Gln Val
 260 265 270
 Ala Lys Met Ile Asn Leu Met Arg Pro Gly Val Phe Ala Asp Ile Glu
 275 280 285
 Gln Tyr Gln Phe Leu Tyr Lys Val Ile Leu Ser Leu Val Ser Thr Arg
 290 295 300

Gln Glu Glu Asn
 305

<210> 34

<211> 308

<212> PRT

<213> Homo sapiens

<400> 34

Val Glu Cys Phe Ser Ala Gln Lys Glu Cys Asn Lys Glu Lys Asn Arg
 1 5 10 15
 Asn Ser Ser Val Val Pro Ser Glu Arg Ala Arg Val Gly Leu Ala Pro
 20 25 30
 Leu Pro Gly Met Lys Gly Thr Asp Tyr Ile Asn Ala Ser Tyr Ile Met
 35 40 45
 Gly Tyr Tyr Arg Ser Asn Glu Phe Ile Ile Thr Gln His Pro Leu Pro
 50 55 60
 His Thr Thr Lys Asp Phe Trp Arg Met Ile Trp Asp His Asn Ala Gln
 65 70 75 80
 Ile Ile Val Met Leu Pro Asp Asn Gln Ser Leu Ala Glu Asp Glu Ile
 85 90 95
 Val Tyr Trp Pro Ser Arg Glu Glu Ser Met Asn Cys Glu Ala Phe Thr
 100 105 110
 Val Thr Leu Ile Ser Lys Asp Arg Leu Cys Leu Ser Asn Glu Glu Gln
 115 120 125
 Ile Ile Ile Phe Ile Leu Glu Ala Thr Gln Asp Asp Tyr Val Leu Glu
 130 135 140
 Val Arg His Phe Gln Cys Pro Lys Trp Pro Asn Pro Asp Ala Pro Ile
 145 150 155 160
 Ser Ser Thr Phe Glu Leu Ile Asn Val Ile Lys Glu Glu Ala Leu Thr
 165 170 175
 Arg Asp Gly Pro Thr Ile Val His Asp Glu Tyr Gly Ala Val Ser Ala
 180 185 190
 Gly Met Leu Cys Ala Leu Thr Thr Leu Ser Gln Gln Leu Glu Asn Glu
 195 200 205
 Asn Ala Val Asp Val Phe Gln Val Ala Lys Met Ile Asn Leu Met Arg

210 215 220
 Pro Gly Val Phe Thr Asp Ile Glu Gln Tyr Gln Phe Ile Tyr Lys Ala
 225 230 235 240
 Met Leu Ser Leu Val Ser Thr Lys Gln Asn Gly Asn Ala Leu Thr Thr
 245 250 255
 Leu Ser Gln Gln Leu Glu Asn Glu Asn Ala Val Asp Val Phe Gln Val
 260 265 270
 Ala Lys Met Ile Asn Leu Met Arg Pro Gly Val Phe Thr Asp Ile Glu
 275 280 285
 Gln Tyr Gln Phe Ile Tyr Lys Ala Met Leu Ser Leu Val Ser Thr Lys
 290 295 300
 Glu Asn Gly Asn
 305

<210> 35

<211> 335

<212> FRT

<213> *Drosophila melanogaster*

<400> 35

Glu Thr Asn Leu Met Ala Glu Gln Val Glu Glu Leu Lys Asn Cys Thr
 1 5 10 15
 Pro Tyr Leu Glu Gln Gln Tyr Lys Asn Ile Ile Gln Phe Gln Pro Lys
 20 25 30
 Asp Ile His Ile Ala Ser Ala Met Lys Gln Val Asn Ser Ile Lys Asn
 35 40 45
 Arg Gly Ala Ile Phe Pro Ile Glu Gly Ser Arg Val His Leu Thr Pro
 50 55 60
 Lys Pro Gly Glu Asp Gly Ser Asp Tyr Ile Asn Ala Ser Trp Leu His
 65 70 75 80
 Gly Phe Arg Arg Leu Arg Asp Phe Ile Val Thr Gln His Pro Met Ala
 85 90 95
 His Thr Ile Lys Asp Phe Trp Gln Met Val Trp Asp His Asn Ala Gln
 100 105 110
 Thr Val Val Leu Leu Ser Ser Leu Asp Asp Ile Asn Phe Ala Gln Phe
 115 120 125
 Trp Pro Asp Glu Ala Thr Pro Ile Glu Ser Asp His Tyr Arg Val Lys
 130 135 140
 Phe Leu Asn Lys Thr Asn Lys Ser Asp Tyr Val Ser Phe Val Ile Gln
 145 150 155 160
 Ser Ile Gln Asp Asp Tyr Glu Leu Thr Val Lys Met Leu His Cys Pro
 165 170 175
 Ser Trp Pro Glu Met Ser Asn Pro Asn Ser Ile Tyr Asp Phe Ile Val
 180 185 190
 Asp Val His Glu Arg Cys Asn Asp Tyr Arg Asn Gly Pro Ile Val Ile
 195 200 205
 Val Asp Arg Tyr Gly Gly Ala Gln Ala Cys Thr Ile Cys Ala Ile Ser
 210 215 220
 Ser Leu Ala Ile Glu Met Glu Tyr Cys Ser Thr Ala Asn Val Tyr Gln
 225 230 235 240
 Tyr Ala Lys Leu Tyr His Asn Lys Arg Pro Gly Val Trp Thr Ser Ser
 245 250 255
 Glu Asp Ile Arg Val Ile Tyr Asn Ile Leu Ser Phe Leu Pro Gly Asn
 260 265 270

Leu Asn Leu Leu Lys Arg Ala Ile Ser Ser Leu Ala Ile Gln Met Gln
 275 280 285
 Tyr Cys Ser Thr Ala Asn Val Tyr Gln Tyr Ala Lys Leu Tyr His Asn
 290 295 300
 Lys Arg Pro Gly Val Trp Ser Ser Glu Asp Ile Arg Val Ile Tyr
 305 310 315 320
 Asn Ile Leu Ser Phe Leu Pro Gly Asn Leu Asn Leu Leu Lys Arg
 325 330 335

<210> 36

<211> 237

<212> PRT

<213> Yersinia sp.

<400> 36

Thr Asn Asp Pro Arg Tyr Leu Gln Ala Cys Gly Gly Glu Lys Ile Leu
 : 5 10 15
 Asn Arg Phe Arg Asp Ile Gln Cys Cys Arg Gln Thr Ala Val Arg Ala
 20 25 30
 Asp Asn Tyr Ile Gln Val Gly Asn Thr Arg Thr Ile Ala Cys Gln Tyr
 35 40 45
 Pro Leu Gln Ser Gln Leu Glu Ser His Phe Arg Met Leu Ala Glu Asn
 50 55 60
 Arg Thr Pro Val Leu Ala Val Leu Ala Ser Ser Ser Glu Ile Ala Asn
 65 70 75 80
 Gln Arg Phe Gly Met Pro Asp Tyr Phe Arg Gln Ser Gly Thr Tyr Gly
 85 90 95
 Ser Ile Thr Val Glu Ser Lys Met Thr Gln Gln Val Gly Leu Gly Asp
 100 105 110
 Gly Ile Asn Met Tyr Thr Leu Thr Ile Arg Glu Ala Gly Gln Lys Thr
 115 120 125
 Ile Ser Val Pro Val Val His Val Gly Asn Trp Pro Asp Gln Thr Ala
 130 135 140
 Val Ser Ser Glu Val Thr Lys Ala Leu Ala Ser Leu Val Asp Gln Thr
 145 150 155 160
 Ala Glu Thr Lys Arg Asn Met Tyr Glu Ser Lys Gly Ser Ser Ala Val
 165 170 175
 Ala Asp Asp Ser Lys Leu Arg Pro Val Ile His Cys Arg Ala Gly Val
 180 185 190
 Gly Arg Thr Ala Gln Leu Ile Gly Ala Met Cys Met Asn Asp Ser Arg
 195 200 205
 Asn Ser Gln Leu Ser Val Glu Asp Met Val Ser Gln Met Arg Val Gln
 210 215 220
 Arg Asn Gly Met Val Gln Lys Asp Glu Gln Leu Asp Val Leu Ile Lys
 225 230 235 240
 Leu Ala Glu Gly Ala Met Cys Met Asn Asp Ser Arg Asn Ser Gln Leu
 245 250 255
 Ser Val Glu Asp Met Val Ser Gln Met Arg Val Gln Arg Asn Gly Met
 260 265 270
 Val Gln Lys Asp Glu Gln Leu Asp Val Leu Ile Lys Leu Ala Glu
 275 280 285

<210> 37

<211> 7

<212> PRT
 <213> Artificial Sequence

<220>
 <223> Fluorescently-labeled phosphopeptides derived from amino acids 1170-1176 of the EGF receptor sequence.

<221> PHOSPHORYLATION
 <222> (4)...(4)

<400> 37
 Asn Ala Glu Tyr Leu Arg Val
 1 5

<210> 38
 <211> 6
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Preferred substrate for PTB1B, corresponding to residues 988-993 of human EGF receptor.

<221> PHOSPHORYLATION
 <222> (5)...(5)

<400> 38
 Arg Ala Asp Glu Tyr Leu
 1 5

<210> 39
 <211> 11
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Substrate for PTBs synthesized from residues 1142-1152 of human insulin receptor.

<221> PHOSPHORYLATION
 <222> (5)...(5)

<400> 39
 His Arg Asp Ile Tyr Glu Thr Asp Tyr Tyr Arg
 1 5 10

<210> 40
 <211> 10
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Substrate for PTBs synthesized from residues

601-599 of p161ck, the src-like lymphocyte specific protein tyrosine kinase that is a physiological substrate for CD45.

221 PHOSPHORYLATION

222 (6)...(6)

400 40

Ala Thr Gln Gly Gln Tyr Gln Pro Gln Pro
1 5 10

61

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